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No. 1350

Physical &
Applied Sci.
Engineering

THE South African MINING JOURNAL

WITH WHICH IS INCORPORATED

"The South African Mines, Commerce & Industries"

ESTABLISHED 1891

PUBLISHED EVERY SATURDAY

VOL. XXVI., PART II. No. 1350.] THE SOUTH AFRICAN MINING JOURNAL. AUG. 11, 1917. [WEEKLY. PRICE 6D

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Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXVI., PART II.] AUGUST 11, 1917. [No. 1350.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone 913. P.O. Boxes 963 and 418.

Cable and Telegraphic Address: "MINING JOURNAL."

AGENTS FOR GREAT BRITAIN: Argus South African Newspapers, Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Gotham Advertising Co., 95, Liberty Street, New York.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; Union of South Africa and Rhodesia, £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

The board of directors of the Springs Mines, Ltd., on the recommendation of the company's consulting engineer, has decided to increase the crushing capacity of the reduction plant from 30,000 tons to 40,000 tons per month. The additional plant will be secured locally and is expected to be in commission about the end of the year. The cost of the additional plant is estimated at £50,000.

* * * *

The report of the directors of the New Modder for the quarter ending 30th June, 1917, shows

New Modder Position. that development work resulted as follows:—Total footage, 4,309; total footage sampled on reef, 2,215. The payable reef

disclosures were as follows:—Main Reef Leader: 1,440 feet; width, 13 inches; assay value, 35·1 dwts. On the 4th July, 1917, the following information regarding the new plant was issued to shareholders through the medium of the press:—"Regarding the new plant in course of erection, there appears to be no doubt that the reduction plant will be completed at the end of the year. This however, cannot be brought into commission until the winder at the circular shaft is erected. After various delays, work on winder is now proceeding, but on account of the uncertainty of continuity of the work, coupled with possible delays in shipment and marine loss, directors cannot state with any certainty when new plant will be at work. Shareholders will be advised when winder arrives in South Africa." In the following accounts no allowance has been made for sums which will accrue to this company under the Bewaraplots Moneys Application Bill. In the absence of the publication of the new Income Tax Laws, the estimated sum to be paid has been based on the Laws in existence previously. A considerable proportion of the total development footage, viz., 1,753 feet, was in the nature of incline shaft sinking, subsidiary inclines for economical handling of ore, main haulage roads and ore passes. The percentage and value of the payable reef disclosures were somewhat lower than usual, owing to the amount of prospecting work done on upper leaders, from which the results obtained varied considerably. The native labour position has not been satisfactory. The twentieth ordinary general meeting of shareholders will be held in the Board Room, The Corner House, Johannesburg, on Wednesday, the 28th November, 1917, at 11 a.m.

* * * *

An "Interim Report on Industrial Efficiency and Fatigue" has been issued by the Health of Munition Workers Committee appointed by the Minister of Munitions to investigate circumstances affecting the personal health

and physical fitness of workers in munition factories and workshops. Already this committee has issued 17 memoranda upon various subjects connected with the enquiry. The present report deals more particularly with problems of output, lost time, and sickness. Although mainly concerned with munition workers, and to a certain extent dealing with the special circumstances arising from the war, the enquiry is likely to prove of permanent value in the solution of many industrial problems. There has hitherto been but little attempt to examine these problems in a scientific manner, and the questions involved have been largely left to the individual judgment of our captains of industry. While giving the latter full credit for a sincere desire to organise their works with the view of securing the maximum efficiency of the workers, it is clear that the methods hitherto adopted have not always been in accordance with physiological principles, because little or no attempt has been yet made to ascertain the fundamental laws upon which efficiency depends. It is not always to be assumed as a matter of course that loss of time and indifferent output are merely the result of shirking or malingering on the part of the workers, although cases of this kind have doubtless been too frequent.

The Union Geological Survey has issued Sheet No. 27 (Cape Province), and a description has been written by Dr. du Toit, who made a geological survey of the area in the years 1903-04 and 1910-12. The sheet has an area of 5,160 square miles, of which less than a quarter is in the Divisions of Elliot, Maclear, and Barkly East occupied by Europeans, the remainder is in native occupation, with the exception of small groups of farms near Umtata and Tsolo. Farm surveys were available for the country settled by Europeans, and Dr. du Toit made a topographical survey, based in the beacons of the secondary triangulation, of the native country on the scale of 800 Cape rods to the inch. The map was reduced by photography to half this scale. The north western part of the area, as far as the crest of the Drakensberg, is known as Griqualand East, and it includes the Divisions of Maclear, Tsolo, Qumbu, Mount Fletcher, Mount Frere, and Mount Ayliff; the eastern covers the Division of Pondoland called Libode and parts of Tabankulu, Ngqeleni, Lusikisiki, and St. Johns; and on the south are the Tembuland Divisions of Umtata, Engcobo, and Elliot. As Dr. A. W. Rogers, the Director of the Geological Survey, points out in his introduction, the country included in this sheet is of exceptional geological interest on account of the almost complete succession of the various members of the Karroo system found in it, while there is a very great development of intrusive rocks in the Karroo beds. The economic possibilities of the area, so far as minerals are concerned, are chiefly in the magmatic ores of the large intrusions of basic rocks in the Insizwa and Tabankulu, and the coal-bearing Molteno beds. As the limits of the sheet cut through the intrusions in question, Dr. du Toit has added a map and description of the whole of the Insizwa, Tabankulu, and Tonti Mountains.

* * * *

The report of the directors of the Village Deep for the quarter ended 30th June, 1917, shows a working profit of £59,137 for the period.

Village Deep, Ltd. Development work resulted as follows: Total footage, 4,771 ft.; total footage sampled on reef, 1,907 ft. The payable reef disclosures were as follows: Main Reef Leader, 1,115 ft.; width, 22 ins.; assay value, 18·0 dwts. The results show improvement over the preceding quarter, the tonnage milled increasing by 14,700 tons and the profit by £6,952. The yield and working costs were 1s. 2d. and 1s. 5d. per ton lower respectively, the profit per ton being therefore 8d. higher. Development operations are being well maintained, and continuous progress is made in the sinking of the main incline shaft. Owing to practically all driving being done under the reef, which is subsequently tested and exposed by boxholing, the proportion of footage on reef to the total development footage is small. In the quarter's accounts no allowance has been made for sums which will accrue to this company under the Bewaarplaats Moneys Application Bill. In the absence of the publication of the new Income Tax Laws, the estimated sum to be paid has been based on the laws in existence previously.

* * * *

The report of the directors of the Nourse Mines, Ltd., for the quarter ended 30th June, 1917, **Nourse Mines, Ltd.** shows that a working profit of £21,916 was made in the period. The profits for the year ended June 30, were £117,887. The results of development work were as follows: Total footage, 4,547 ft.; total footage sampled on reef, 2,040 ft. Payable reef disclosures were as follows: Main Reef, 80 ft.; width, 61 ins.; assay value, 8·1 dwts. Main Reef Leader: 810 ft.; width, 19 ins.; assay value, 21·6 dwts. South Reef: 270 ft.; width, 54 ins.; assay value, 8·4 dwts. The results for the quarter were seriously affected by the constant decrease in the company's native labour force. On this account it has only been possible to operate the plant at considerably under its capacity. The yield was also nearly 2s. per ton lower than in the preceding quarter. In the quarter's accounts no allowance has been made for sums which will accrue to this company under the Bewaarplaats Moneys Application Bill. In the absence of the publication of the new Income Tax Laws, the estimated sum to be paid has been based on the laws in existence previously. The twenty-first ordinary

general meeting of shareholders will be held in the board room, The Corner House, Johannesburg, on Wednesday, the 28th November, 1917, at 12 noon.

* * * *

The report of the directors of the Bantjes Consolidated for the quarter ended June 30 shows that

The Bantjes Position. the results of development work were as follows: Total footage, 4,143; total footage sampled on reef, 3,205. The payable reef disclosures were as follows: Leader (including some Main Reef), 1,300 feet; width, 21 inches; assay value, 13·0 dwts.; South Reef, 125 feet; width, 14 inches; assay value, 18·5 dwts.

The operations of the past quarter show a loss of £7,815. The yield shows an increase of 2s. 6d. per ton milled compared with the previous quarter, and the costs an increase of 1s. 10d. per ton milled, making a decrease of 8d. in the loss per ton milled. The tonnage mined from the Leader reserves totalled about 23,000 tons, equal to 38 per cent. of the tonnage mined. The total development accomplished was 4,143 feet, a decrease of 118 feet on last quarter, equal to an average of 1,381 feet per month. Shareholders were fully advised at the annual meeting held on June 26 last, of the arrangements made by the Board for financing the company to enable a more vigorous development policy to be adopted, subject to the development results in the near future proving satisfactory. They were also told that whilst the Leader development values obtained for the first five months of 1917 were in keeping with those of 1916, during the month of May several of the drives, raises and winzes had become unpayable. These poor Leader values have unfortunately continued during June and July, and the position is that the Leader drives in the new areas now being opened up, which were previously developing payable ore, have nearly all become unpayable—not only in the vicinity of the incline shaft, but also in other parts of the mine. From this it will be seen that the development operations for the three months ended July 31 are most disappointing, and with the gradually depleting ore reserve the outlook is most discouraging. It is obvious that if the present unpayable results continue much longer the proposed financing of the company will not be warranted. It is the intention of the board to test the Leader for a further three months, but unless a very unexpected improvement occurs during that time, development operations will then have to be stopped, and milling operations continued as long as profits can be earned, after which the mine will be closed down.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of

Rhodesia Chamber of Mines. June, 1917, shows that the number of natives employed in May shows a decrease of 1,569 as compared with the corresponding month in 1916. The attention of the Executive has been drawn to certain experimental tests which are now being carried out on the Crown Mines and Premier Diamond Mines in the Transvaal, and De Beers Mine, Kimberley, with the object of immunising natives from attacks of Pneumonia by means of a vaccine which is now being prepared at the South African Institute of Medical Research. It is not expected that these tests will be concluded until the end of October next and the report in regard thereto will probably not be ready before the end of the year. The results so far obtained are said to be distinctly promising, and in the event of the success aimed at being achieved it will be difficult to exaggerate its importance to the mining industry. On the 1st August the new forms in connection with the monthly mineral production returns came into use as provided by the Mines and Minerals Amendment Ordinance, 1917. On and after that date it will not be necessary to declare these returns before a Justice of the Peace as hitherto, but any person having full knowledge of the facts as stated therein may certify them. The Bechuanaland Exploration Co., Ltd., has joined the Chamber and Mr. H. U. Moffat has been appointed as its representative member. Other matters dealt with during the month were as follows: Mining Supplies; Miners' Phthisis; Compound Inspectors' Duties; Bravery of Employees on Mines; and Railage on low grade Asbestos to Johannesburg.

TOPICS OF THE WEEK.

UNDERGROUND CONTRACTS.

THE report of the Departmental Committee on the contract system on the mines comes at an opportune moment. It is remarkable for the fact that it constitutes the unanimous finding of a body representative of the Government, the employers and the mine employees on a subject that has long been a fruitful source of contention between mines and men, and is even to-day the chief factor in the list of grievances put forward by the Mine Workers' Union. Had the Departmental Committee been appointed as a result of the latest demands of the men, indeed it could hardly have evoked a more valuable contribution to the settlement of the questions now at issue. As a fact, the Committee began its labours as far back as December, 1916; it examined no less than forty witnesses, and held some fifteen public sittings. In Messrs. John Munro and F. G. A. Roberts of the Chamber of Mines, and Messrs. Coward and Toomey of the men's organisations, both employers and employed found able and experienced representatives, and the scales were equalized by the presence in the chair of Mr. Malcolm Ferguson, Acting Chief Inspector of Mines. Early in the report it is pointed out that the Committee found it very difficult to arrive at facts in the evidence that was led. The majority of witnesses merely submitted a repetition of opinions which had already been expressed by others. Consequently, the Committee decided that no good purpose would be served by prolonging its sittings. In compiling its report the Committee "has freely drawn upon the knowledge and experience of its individual members for commonly accepted facts, and has also consulted various authorities, including reports of other Commissions dealing with the same terms of reference." A tendency noticed by the Committee was that of some witnesses to refer to past conditions as if they were still in existence. This was particularly apparent in the case of certain grievances which on further questioning were found to be second-hand, and of remote origin, besides being non-existent under present-day conditions. The report in turn discusses the various methods in use on these fields for the payment of miners, the history of the contract system, the many complaints and difficulties involved, their simplification, and the system as affecting natives. A summary of the findings and recommendations on these questions is printed elsewhere in this issue; and the chief immediate importance of those findings obviously lies in their application to the present issues between employers and employed in the industry. It will be remembered that the discussion of questions bearing on the contract system was reserved at the recent conference between the Chamber of Mines and the Unions until the publication of this report, and that the latter was expedited with a view to its aid in the elucidation of the points now at issue. It certainly does assist materially in the direction anticipated. The recent lengthy programme of the miners' grievances, it will be recalled, demanded, *inter alia*, "(3) That there be no further reduction in contract prices at any working place on any mine during the period of the war, or for three months after." The whole of the present report may be said to be an answer to that demand, and if its recommendations be put into effect the grievances on which the request is based will cease to exist. Again, demand No. 4 in the programme was as follows: "That all contracts contain a guarantee equivalent to the recognised day's pay for that particular class of work." This request is specifically dealt with, and disposed of, in the following paragraphs of the report:—

94. We are in agreement with the view that there should be guaranteed minimum or make-up rates, and that these rates should be only somewhat lower (say, 20 per cent.) than the prevailing day's pay rate for the particular class of work; *but we are unable to find that there is any logic whatever in the suggestion that the minimum rates should be the day's pay rates.*

95. If all the miners were equally competent and equally willing to secure maximum efficiency, something might be said for such a course, but as this is not the case, the suggestion does not appear

to us, to be morally sound, because it would make the "contract" something in the nature of a "heads I win tails you lose" arrangement, whereby the miner has it both ways, and the company takes all the risks. In other words, it would not be a "contract" as understood amongst mining men.

Demands Nos. (5) to (9) inclusive are also answered very effectively by the report of the Committee. It may be recalled that they are as follows:—(5) "The system of the white man being on contract and the coloured boy on day's pay be abolished." (6) "That the whole question of the contract system be inquired into, together with the form of contracts." (7) "The cost and quality of explosives to be inquired into." (8) "That the cost of stores revert to pre-war prices." (9) "That the present system of charging men for machine spares, etc., be abolished." In No. (5) it will be seen that the second portion of the demands is supported by the recommendations of the Committee. No. (6), it will be seen, is sufficiently answered by the report itself in general, and in particular by its advocacy of the "flat price no cost contract" system as the best for all concerned. By its general adoption, moreover, it will be seen that demands Nos. (7), (8) and (9) fall to the ground, since the merit of this method is that there are no charges for stores or labour included. The Committee, indeed, without labouring the advantages overmuch, makes out a very strong case for the general adoption of this system. Though expressly stating that it is not prepared to recommend the adoption of any particular system, the Report says:—

"The Committee, however, wishes to put forward for earnest consideration the suggestion that when it is desired to use a method of payment by results, the "flat price no cost contract" with a make-up in the nature of a basic rate should be more generally adopted. With the exception, perhaps, of some elaborately designed bonus system which would be difficult to understand, the "flat price no cost contract" is the only one which regulates the earnings in exact proportion to the work done; it further has the merit of simplicity, and since there are no charges for stores and labour, its price will be comparatively low, so that ordinary inaccuracies in measurements will not materially affect a man's earnings. Objections, of course, can be raised to most things, and we realise that the "flat price no cost contract" is no exception to this rule. We, however, believe that most of the difficulties can be overcome. In evidence, it was stated by some witnesses that a charge for stores and native labour was an absolute necessity in order to guard against wastefulness on the one hand and over-marking of the native tickets on the other. In view, however, of the fact that 37 per cent. of the men engaged in breaking ground during 1915, for example, were employed on the day's pay system where no charge is made for these commodities, it seems that by means of comparative statistics or otherwise there must be some method of controlling these matters, and that the difficulty is not so great as might at first appear. But even in the absence of any elaborate method of checking, we think that the point could be met by offering, for instance, separate bonuses for economics in one or other respect. In suggesting the "flat price no cost contract" the Committee has in mind that it is generally to the interests of all parties that fundamental issues should be clear cut."

In this recommendation, coupled with that regarding the appointment of a Government Inspector of Measurements, and a graduated system of day's pay for inexperienced men, it may be said, lies the chief constructive value of the report. And it will plainly be no small matter of congratulation if this Committee, representative of Government, the mines, and the men, has at last evolved a generally acceptable system of payment for underground work that will meet the objections of the Mine Workers' Union, and remove the most fruitful source of friction on the mines.

The negotiations between representatives of the Chamber of Mines and the Federation of Trades and

Mine Workers' Demands. Mine Workers' Union concluded last week, and the official reply of the Chamber to the demands of the workers was handed

to the secretary of the Federation. The reply will be considered, in the first instance, by the executives of the unions concerned, and a joint meeting of delegates will be held this (Saturday) evening, at which the views of the different executives will be considered.

MINE CONTRACTS: REPORT OF DEPARTMENTAL COMMITTEE.

The report of the Departmental Committee on underground mining contracts, which commenced its sittings in January, was issued this week. The Committee consisted of Messrs. Malcolm Ferguson (Chairman), J. Coward, J. Munro, F. G. A. Roberts and N. Toomey. In making their recommendations the members of the Committee desire it to be understood that some of the courses or practices proposed are in use to a greater or less extent. The following is a summary of the conclusions:

The contract system in use on the Witwatersrand comprises an altogether unnecessary number of variations both in detail and practice, some of which are difficult to understand.

The contract system is not necessarily deleterious as regards the health or safety of those concerned, or morally unsound and against the public interest.

Many misunderstandings arise because each party hears only one version of the case, and neither has an opportunity of ascertaining all the facts of the case.

Mine surveyors generally are competent to carry out measurements in connection with contract work.

In contract work other than development some men have experienced difficulty in accepting the accuracy of the measurements given.

There are extremely wide variations in the skill of both European and native miners on the Witwatersrand.

As under the circumstances there can be no such thing as a normal standard of efficiency which can be applied to the mines or from which a man's ability as a miner can be infallibly judged, the suggestion frequently made that mines should employ only efficient men, and that those who do unsatisfactory work shall always be dismissed, is not in every case a feasible or reasonable course for the mines to adopt.

The earnings of individuals under some of the contract systems vary widely in different proportion as compared to the variations in the amount of work done.

Much of the difficulty in connection with contract work arises through men commencing such work before they have sufficient knowledge.

That there is a confusion of thought in regard to the meaning of phrases and aims, and that an impression exists in some quarters that in those cases where the guaranteed portion of the pay in one or other of the systems is less than the prevailing day's pay rate it is so arranged with the deliberate intention of eventually setting up such lower rates as the standard for day's pay.

That the danger to health from exposure to dust is now very fully realised, and there is much less likelihood of the regulations being contravened for the sake of gain than was formerly the case.

That under certain conditions it is a matter of great difficulty to accurately measure the actual amount of work done.

That a great deal of confusion and misunderstanding has arisen through the day's pay system having been combined or blended with the contract system.

RECOMMENDATIONS.

(1) That there should be some person or body in touch with all the mines to whom any properly accredited representative of the men could have access for the purpose of talking things over without too many formalities.

(2) That Clause 6 of the standard agreement re underground work should be amended. Also that the working of this agreement be simplified or a simple comprehensive summary drafted.

(3) That the Mines Department employ for not less than one year a competent surveyor, with assistance if necessary, as an inspector of measurements.

(4) That a man who is to work on contract should be given an opportunity to see the place in which he has to work before he is regarded for record purposes as having definitely engaged himself.

(5) That in every case the terms of employment should be negotiated at the time a man is taken on, and not altered thereafter except by mutual consent or after due notice, and further, that Regulation No. 122 (Mines and Works Regulations) should be understood to include cases where only a part of the payment is based on measurement of work done, and to mean that the agreement referred to therein shall be completed before work is commenced, or at any rate within twenty-four hours of such time.

(6) That methods of payment in which the ordinary inaccuracy of measurement, considered in relation to the price, permits the earnings of an average man to be affected to a greater extent than, say, 5 per cent., should be prohibited.

(7) That until men have had two years' experience of underground work, they should be employed on a day's pay basis.

(8) That in order to improve the day's pay method of payment so that it could be made more use of to mutual advantage, it should be put on a more comprehensive and definite basis by formulating a scheme whereby a man commencing work on the mines for the first time should be engaged at some uniform basic rate, and that he should be periodically raised thereafter in well-defined steps over a period of, say, two years, to a standard minimum rate fixed in respect of each occupation.

(9) That while the adoption of any particular system is not definitely recommended, it is strongly urged that when it is desired to use a method of payment by results, the "flat price no cost contract" with a make-up in the nature of a basic rate should be more generally adopted.

(10) That the piece-work system as applied to natives be further extended.

(11) That the day's pay system and the contract system *per se*, respectively, should be kept entirely separate and distinct from one another, and no combination or blending of the two systems should on any account be permitted to occur.

The Committee considers it desirable that the recommendations should be given immediate effect to, but since the industry has shown its willingness to act upon recommendations made in the past by previous Commissions and Government Committees, it is not recommended that recourse be had to legislation, because even if such a course were possible it would not be desirable in some instances.

Durban Roodepoort Deep.

The report of the directors of the Durban Roodepoort Deep for the quarter ended June 30 shows that the results of development work were as follows: Number of feet driven, sunk and risen, exclusive of stopes, 2,292 feet. The payable reef disclosures were as follows: Main Reef, 175 feet; width, 30 inches; assay value, 11·9 dwts.; South Reef, 1,025 feet; width, 7 inches; assay value, 34·0 dwts. The development accomplished was again a little less than during the previous quarter. Exposures were slightly lower generally, but chiefly in the Main Reef, the South Reef being about normal. Crushing increased further compared with last quarter, but the grade has fallen. The yield is 1s. 11d. lower and the costs 1s. 1d. lower, giving a fall in profit of 10d. per ton milled. The native labour supply remains good on this mine, in spite of the shortage elsewhere, the bulk of the natives coming voluntarily. In the absence of the publication of the new Income Tax Laws, the estimated sum to be paid has been based in the accounts on the laws in existence previously.

Tenders are being invited for the construction of the Enyati Railway from Boonlager Siding (Vryheid Line) to Enyatisberg, 14 miles in length, with three sidings, for the Enyati Colliery, Ltd., a company registered in Mauritius.

THE GEOLOGY OF THE INSIZWA MINING AREAS.*

TAKING the mineral leases in order from east to west, the gabbro-hornfels contact, on the *Nolengeni Mining Area*, is dipping northwards at from 20 to 25 degrees. The footwall has little veins or patches of granite (or quartz-diorite with ill-defined boundaries, while similar granitic veins from an inch to over a foot in width traverse the gabbro as well). A level about 450 feet long has been driven in obliquely to the outcrop, so as always to follow the contact; a little higher up the gully an incline 140 feet long was put down to meet the level, while further up a second incline 200 feet long was driven, falling at the rate of 1 in 4. In the working the mineralisation roughly follows the contact, but at two points at least in the upper incline sulphides were found both in the olivine-gabbro about three feet above the junction and in the hornfels at about the same distance below it. Again in the lower incline ore has been found to run in the hornfels more or less parallel to the contact and to rise up at intervals to meet the latter. Some of the fine-grained micro-granite dykes are also mineralised.

On *MacGregor's Area* the base of the gabbro is dipping at 40 degrees, and along it chalcopyrite and pyrrhotite are common, a good deal being in the disseminated condition; sulphides are found in the hornfels also. The workings consist of an adit, a shaft, and several small pits; an adit low down was abandoned without having reached the contact.

On the *Payne Syndicate's Area* there is an adit of 390 feet long and the dip on the contact is $2\frac{1}{2}$ degrees; the olivine-gabbro here contains xenoliths of various types, while there is a good deal of hybrid gabbro-hornfels material. Sulphides occur mostly in the footwall with chalcopyrite predominating, but the ore is said to run higher in nickel than elsewhere, a feature that can be ascribed to the presence of niccolite (arsenide of nickel)—which is obtainable here in addition to pentlandite. At a point a couple of hundred yards south of the adit a sheet of ophitic dolerite rises and merges with the gabbro and the hornfels in the angle at the junction has been broken and pulled out into strips. Niccolite occurs in small quantity both as veinlets in the hornfels and disseminated in the dyke.

At the *Mount Ayliff Development Syndicate's Area* shafts have been put down to strike the contact, and the olivine-gabbro has patches containing epidote and biotite, and is in places rich in chalcopyrite and pyrrhotite.

The *Insizwa Mining Area*.—Copper ore was discovered here many years ago in a small ravine known as the Waterfall Gorge, and a good deal of development work has been carried out, more especially after the assays made by Mr. J. G. Rose, F.C.S., had proved the ore to carry nickel and (subsequently) platinum. The ore was first opened up in a strip of light-coloured rock, perhaps a couple of hundred feet in length and up to a few feet in width, enveloped in weathered gabbro and striking obliquely towards the contact. It appears to be a large mass of shale torn off by the intrusion, tilted on edge and metamorphosed; in places it is brecciated and part consists of calc-silicate hornfels. Immediately below this point, and also on the right bank of the stream, a level has been driven in for a distance of about 600 feet, following the contact with offsets here and there. A sheet of nearly solid ore (chalcopyrite and pyrrhotite) occurs over a considerable distance along the actual junction of the two rocks, swelling out to a thickness of two feet in places. At a distance of a couple of feet away the hornfels is usually almost or quite barren, but in one place a sheet of sulphides leaves the contact, runs into the footwall nearly horizontally, and then rising resumes its inclined position. Along this offshoot the nearly vertical joints in whitish quartzite above and below the ore body are filled with thin sheets of bornite. Above the contact the gabbro carries a good deal of disseminated sulphide. On the opposite side of the stream an adit has cut the gabbro at 580 feet, the junction dipping at about $2\frac{1}{2}$ degrees. Here, too, the ore occurs along the contact in patches and lenticles, but the bulk is disseminated in a fairly even manner through a zone in the gabbro, or rather gabbro-pyrrhotite, 5 or 10 feet above the contact and with a thickness of at least 20 feet without the top being seen. It is clear from the observations here, from those made by Mr. W. H. Goodchild at a subsequent date, and from analogy with the other occurrences that the mineralised zone is really the south-eastern edge of a lens-shaped body of pyrrhotite extending in below the mountain, separated from the hornfels base by a thin zone of less basic rock and overlain by olivine-gabbro; this sulphide-bearing portion of the intrusion is also dipping inwards.

At *Drew's Area, Sugarbush*, the extreme edge of the above-mentioned very basic zone is hidden, and pale olivine-free gabbro, with numerous granitic patches and veins and with druses lined with crystals of white felspar and faintly pink quartz, rests directly upon the hornfels. The rock contains occasional pellets of sulphides.

On the *Ndakeni Area* a shaft and adit have been made on the junction of a nearly vertical dyke with hornfels at the foot of the range. The country rock was found to be stained with copper carbonates and limonite, but no large ore bodies seem to be present. North of the *Umzimvubu* gorge no prospecting work has been carried out, though the contact can be located closely for ten miles.

THE ORE DEPOSITS.

In most instances prospecting pits have been sunk wherever the rocks were found stained with green carbonate of copper (malachite)—probably also with the silicate of nickel (garnierite)—produced by

weathering of sulphides and accompanied by a good deal of hydrated oxide of iron (limonite). Practically three minerals make up the ore patches, two of which are always distinguishable by the eye in hand specimens. The most abundant mineral is pyrrhotite, a sulphide of iron of slightly variable composition, recognisable by its bronzy metallic lustre and somewhat platy structure, and by the fact that it is feebly magnetic. The second mineral is chalcopyrite or copper pyrite, a sulphide of copper and iron easily identified by its brassy appearance and soft nature. Goodchild has investigated this mineral, and has found that it differs from normal chalcopyrite in possessing a lower ratio of copper sulphide to iron pyrite; the percentage of metallic copper is about 30. The third important mineral is pentlandite, a sulphide of nickel and iron, containing from 20 to 35 per cent. of metallic nickel and possessing a pale bronzy colour. Niccolite (arsenide of nickel) and bornite (sulphide of copper and iron) have occasionally been observed. Though platinum almost invariably accompanies the other metals, and though its assay value is occasionally more than an ounce to the ton, the exact condition in which it occurs is uncertain. The presence of niccolite led me to the belief that it existed as the arsenide (sperrylite), as at Sudbury in Canada, but the fact that concentrates obtained by the flotation process were almost devoid of this metal and that detrital ilmenite from the weathered gabbro carried platinum threw doubt upon the correctness of this opinion. Goodchild, though obtaining the gold, was unable to isolate any platinum by treatment of the ore with acid, and suggests that it may be closely associated with the silver. The platinum is accompanied by palladium. There is every stage from gabbro or norite with minute scattered particles of ore to a rock in which ore and silicates are in equal amounts, and, finally, to a nearly pure ore with a few patches of silicates scattered through it. These rich sulphide-bearing rocks may form roundish or oval masses, but more commonly give rise to sheet-like bodies running along or roughly parallel to the contact and fading into gabbro nearly devoid of ore. Only in a few cases do such solid sulphide segregations exceed a foot in thickness, but the norite is often rich in disseminated sulphides, and this rock, spangled rather evenly with ore and carrying some 7 or 8 per cent. of sulphides, will form the chief material to be mined. The stuff is low grade, but on the other hand this fact is compensated for by the size of the body, as shown in the workings of the *Insizwa Mine*, while the habit of the deposit gives promise of an even greater development of mineralised rock deeper in beneath the range; quite probably the proportion of sulphides may be higher also. The metallurgical extraction would not be difficult, for the gangue is basic and self-fluxing, and the sulphides could be smelted in blast furnaces to the condition of matte. The rich veins, on which unfortunately most of the development work has been done, are so irregular in their habit that they should not be reckoned upon in mining, though not improbably at greater depths their contributing effect may become quite appreciable. Sulphides are also found in lumps or in the disseminated condition in some of the acid veins cutting the base of the intrusion and in places in the hornfels, but none of the occurrences seen have any commercial value, though the presence of the ores form valuable indicators of the existence of mineralised gabbro in their neighbourhood. As regards the richness of the deposits, little can be said, as most of the assays were made upon the vein-like bodies of ore (figures are given in the Ann. Rept. Geol. Commission for 1910), but the copper and nickel seem to be present in almost equal amounts, totalling perhaps from 2.5 to 3.5 per cent. of metals in the disseminated ores, while the platinum may run from $\frac{1}{2}$ dwt. to 1 dwt. per ton as an average perhaps. Some of the solid sulphide bodies have assayed several ounces of platinum to the ton. The *Nolengeni* ores are stated to have been high in nickel and platinum, and the same was the case on the *Payne Syndicate's Area*. The picrite at the base of the Tabankulu Mountain and some of the olivine-gabbro just above it show small amounts of pyrrhotite and chalcopyrite in every thin section, and the same is the case below the Tonti. This fact should encourage the prospecting of these ranges.

THE GENESIS OF THE ORES.

The gabbro magma must be regarded as the source of the ore, for a petrological examination of the material shows beyond doubt that the sulphides formed portion of the once molten eruptive rock, and that during the cooling of the latter they became segregated within the lower, denser, and more basic phase of the intrusion, impregnating the subjacent strata to a small degree. Upon examining polished surfaces of the ore-bearing rocks under the microscope by reflected light before and after etching with dilute hydrochloric acid, the three sulphide minerals can be identified, and it is found that their order of separation has been (1) Chalcopyrite, (2) Pentlandite, and (3) pyrrhotite. This is the reverse of that obtained by Campbell and Knight in the ore-bodies at Sudbury and in Norway, but this is explained by Goodchild as being due probably to the abnormal composition of the copper-bearing mineral. It is interesting to note that in a nickel-bearing olivine-gabbro from California, Calkins has observed that the separation of the cupriferous and nickeliferous sulphides has preceded that of the pyrrhotite. By transmitted light in thin section the sulphides are found to have been the last minerals to crystallise from the magma, since they surround idiomorphic olivines, are moulded upon the pyroxenes and plagioclase felspars, and sometimes enclose magnetite, just as has been observed at Sudbury and in Norway. All the silicate minerals, including the olivine, are beautifully fresh and unaltered, and, though the latter is traversed by the numerous irregular cracks characteristic of this mineral, no films of ore are found penetrating along these partings, neither along cracks nor cleavages in any of the other silicates. Such secondary minerals as quartz, calcite, chlorite, etc., are conspicuously absent. In the solid sulphide veins Goodchild has

*From "Geological Survey Memoirs," by Dr. T. A. L. du Toit.

bserved small patches of sulphides of more acid type than in the adjacent gabbro, consisting mainly of plagioclase felspar, quartz, cordierite, and biotite; here again the sulphides were the last to separate. In the meantime the sulphides were introduced contemporaneously with the thermal metamorphism of the sediment and, though moulded upon the plagioclase felspar, are earlier than the orthoclase, quartz, and cordierite, in a calc-silicate rock the sulphides enclose magnetite, are moulded on diopside, but are included in wollastonite. Goodchild has made the remarkable discovery that in the contact veins there sometimes occur embedded in the sulphides little metallic grains composed of about two-thirds nickel, 5 to 6 per cent. copper, iron, and silver, and about 1 per cent. gold; the reduction of the metals may have been effected by carbonaceous matter derived from the sediments. We may conjecture that, during the process of cooling of the great sheet of basic matter, differentiation was brought about by the sinking of the olivine crystals, so that at the top the magma was left deficient in magnesia and richer in silica, and solidified as a gabbro without olivine and carrying some micropegmatite. The sulphides, which retained their fluidity to the last, doubtless became concentrated towards the base of the sheet by gravitational action, just as sulphide matte separates from the slag in copper smelting; it might be noticed that the sulphides partially replace magnetite and ilmenite, for the latter minerals are in much smaller quantity than in the dolerite normally. It is precisely at such places where the floor is concave that the ultra basic differentiates would accumulate; hence the association of the sulphides with the picrite and the appearance of the latter below the Tabankulu, Tonti, Ingeli, and Insizwa. The bimetallic structure, so marked about the upper limit of the picrite, has probably been developed through the take of gabbro pressing upon its partially solidified base and causing the latter to squeeze outwards, an action aided by movements due to the change in volume from the liquid to the solid state. In many

respects the Insizwa resembles the Sudbury copper-nickel area in Canada, where the ore-bearer is a much more extensive and thicker basin-shaped sheet of igneous rock, which being less basic to start with has become differentiated into a granophyre above and a norite devoid of olivine below. The ores of copper and nickel have separated from the magma during its cooling and become concentrated in the norite base and in certain offshoots therefrom in the country rocks. The copper ores of Namaqualand, Cape Province, are also of magmatic origin, the sulphides (bornite and chalcopyrite) being disseminated through, or collected to form great masses in, igneous rocks that form dykes or irregular intrusions in gneiss and that vary petrologically from quartz-diorites to hyperstheneites.

The occurrences at Insizwa and their remarkable analogy with those at Sudbury are such as to make one confident of development being renewed at the Waterfall Ravine, and hopeful that before long prospecting on less haphazard lines may be carried out along other parts of the gabbro base. No less than ten miles of contact await exploration in the Insizwa, 15 in the Tabankulu, over 20 miles in the Tonti, reckoning only those along which the conditions appear most favourable to the existence of metalliferous deposits. In view, however, of the manner in which the ores have segregated, it will not be so much along the actual outcrop that workable deposits are to be expected as at a certain distance in below the mountain masses, where the dip of the contact is flattening or where a local inflection of the latter may exist. Valuable information could be obtained by the use of the diamond or shot drill, the holes being put in at an angle to the vertical. The region is one favoured by having an abundance of water and a fair amount of timber, and in possessing a large native population, while the extension of the Cape-Natal line from Franklin to Mount Ayliff will certainly be accomplished should mining developments prove satisfactory.

THE DEVELOPMENT OF THE INDUSTRIAL RESOURCES OF RHODESIA.

Latest Results of the Activities of the Munitions and Resources Committee.

A LARGELY attended meeting of the Rhodesian Munitions and Resources Committee was held at Bulawayo recently, Mr. J. G. McDonald in the chair. A sample of timber was forwarded to the Union Resources and Industries Committee a short time ago to be examined as to its suitability for match manufacture. A letter has been received from the Secretary for Mines and Industries stating that the sample has been submitted to the Lion Match Company, Limited, Rosebank, who think the timber would be suitable for match boxes and matches, but cannot give a definite opinion unless they test a larger sample of fresh green timber. A suitable sized sample is being forwarded for examination.

A firm of merchants who are interested in indigenous timbers and who are manufacturers of a first-class quality of hammer handles has suggested to the Committee that a considerable saving might be effected by users. When a pick handle gets broken it is usually thrown away and a new one put in its place. Instead of discarding broken shafts altogether they advise that the iron ferrules at large and small ends of shaft could be burned off and fixed on a new shaft. The price for an ordinary pick shaft in Rhodesia is something like 3s., whereas the firm in question would be prepared to supply wood shafts for fitting old iron ferrules at about 10s. per dozen. The wood used is "Mangura," and hammer handles manufactured from this timber are equal if not superior in quality to those imported from overseas.

It was stated that full inquiries had been instituted throughout South Africa in regard to the quantity of arsenic consumed in the country, but no records are available to show the amount that is imported into the country, and no distinction appears to be made between non-arsenical dips and those containing arsenic. Before the manufacture of white arsenic could be entertained by anyone it is necessary to ascertain the approximate demand, and an endeavour will now be made to arrive at this by basing calculations on the number of cattle and the number of dipping tanks installed. Large bodies of manganosite are known comparatively close to the railway in Mashonaland, and inquiries are being made as to the possibility of economic manufacture of white arsenic from them. It was reported that sodium hypochlorite is being made on the Falcon Mine by

electrolysis. The raw material is a solution of common salt and the resultant product, sodium hypochlorite, is being successfully used in the native compound and hospital as a disinfectant. It is too early yet to state if the process will be economically successful, but a full report will be made as soon as definite data can be got.

Calcium carbide is also being made on the same mine. This material is getting very scarce in South Africa, as stocks are almost exhausted and it is understood that its export from Great Britain is now prohibited. The Falcon Mine, it was stated, uses the oxy-acetylene welding process for a large amount of repair work, and for this it was necessary to ensure a supply of calcium carbide. Experiments as to its manufacture were started some time ago and had been highly successful, and preparations are now being made to manufacture for the full requirements of the mine. The process is carried out in an electric furnace, the raw material used being wood charcoal and lime. The product when tested, with a weighed quantity, in an acetylene lamp, appears equal in quality to imported calcium carbide. The Committee will be pleased to give details as to its manufacture on the Falcon to anyone who is interested and also has suitable electric plant. The current used on the mine for the process is 3-phase alternating current at about 100 volts.

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THE WEEK IN THE SHAREMARKET.

Business Becomes Brisk After Holidays, but Quietens Down—The Modder East Issue.

As Saturday last and Monday were holidays, the record of the week is only of three days' business and does not demand very extended notice. The majority of dealers resumed business on Tuesday in very good humour and with a distinct bullish feeling. Good buying of several of the favourite stocks began at once, but most notably of Springs Mines, State Mines and Van Ryn Deep, all of which speedily showed moderate improvement in price. Springs Mines, however, after advancing to 60s. 9d. sales, relapsed during the afternoon to 59s. 9d., and the following morning to 59s. 3d., despite the publication of a statement by the company that the reduction plant was to be increased to a capacity for treating 40,000 tons per month. State Mines eased off slightly, but subsequently regained all lost ground. Rooibergs were a good feature on a strong rumour, which is understood to be correct, that the company had exercised an option over adjoining valuable mineralised and partly developed ground, on terms which were regarded as highly favourable. The shares rose from 8s. 9d. to 10s. on fair buying, but the advance has not been fully maintained. Southern Van Ryns made a further advance on steady buying to 11s. and have since been even higher. The issue of the Modder East shares was made on Thursday, and a fair amount of business was done in the shares at 19s. to 19s. 6d. and in the options at 7s. 3d. to 7s. 9d. An official quotation will be followed by much increased activity in both shares and options, both of which promise to be very popular for dealing counters. The Modder stocks have been firm but comparatively inactive. Sub Nigels have been in some demand up to 22s. 6d. and there has been a revival of interest in Daggafontein Mines with moderate business at 22s. 6d. The Van Ryn Deep market has been steadier at the advance. On the Western Rand Main Reefs have shown some slight improvement but the unlucky Bantjes shareholders saw their shares down to 2s. 1d., though the price was slightly higher later. Diamonds have been inactive and Monteleos were lower at 35s. on Thursday, while the Diamond Syndicates have scarcely been quoted. Business during the week has been chiefly confined to a very limited number of stocks, most of which have been mentioned above, and the volume of public business has been but small though inter-professional transactions have been on a considerable scale at times.

* * * * *

Friday morning.—The market opened with a brisk demand for Springs which were bought in some quantity at 59s. 9d. and 60s., but the feature was the business in Modder Easts and the options. The shares were freely bought at 20s. 6d. and 20s. 3d., while several thousands of the options were bought at 8s. 6d. for cash as well as ex London. On the call the tendency was better, but business was not so active as at the opening. Daggafonteins rose to 23s., and State Mines were firm at the advance with sales at 62s. 9d., while Rand Klips improved to 9s. 6d. The Modder stocks had higher buying bids without business, as sellers raised their priees. Generally speaking, from a market point of view the outlook for a resumption of activity was more hopeful.

* * * * *

	Wed.	Thurs.	Fri.	Tues.	Wed.	Thurs.
	1st.	2nd.	3rd.	7th.	8th.	9th.
African Farms	7 7*	7 11	—	7 9*	—	8 0†
Apex Mines	6 0*	6 0*	6 0*	6 3*	6 0*	6 3*
Aurora West	14 6†	14 6†	—	—	14 0†	—
Bantjes Cons. . . .	2 6	3 7	3 0	3 0	2 4	2 5
Brakpan Mines	99 6†	99 0†	—	97 6*	99 0*	99 0*
Brick and Potteries	—	—	—	5 0*	—	5 0*
British South Africa	10 0*	10 0*	—	—	10 0*	—
Bushveld Tins	0 3*	—	0 3*	—	0 3*	0 3*
Cassel Coals	—	—	—	28 0†	—	28 0†

*Buyers. †Sellers. aOdd lots. bEx London.

	Wed.	Thurs.	Fri.	Tues.	Wed.	Thurs.
	1st.	2nd.	3rd.	7th.	8th.	9th.
Cinderella Cons. . . .	—	4 0*	4 0B	4 0*	—	—
City and Suburbans . . .	24 6*	25 0	25 0†	24 6*	24 6*	24 6
City Deeps	72 6*	72 6*	72 6	72 9	—	73 0*
Cloverfield Mines . . .	8 6	8 6	8 5	8 5*	8 6*	8 6*
Clydesdale Cols. . . .	—	—	—	11 0*	—	—
Concrete Construc. . .	1 0*	—	—	—	1 0*	1 0*
Con. Investments . . .	—	—	—	—	19 0†	18 0†
Con. Langlaagte . . .	—	19 6*	—	19 6*	19 6*	19 6*
Con. Main Reefs . . .	14 0	14 6	—	14 3*	14 6*	14 9*
Con. Mines Selection . .	23 6	23 6*	23 6*	23 6*	23 6*	23 6*
Crown Diamonds . . .	2 0†	2 0†	—	1 6*	1 6*	1 6*
Daggafontein Mines . .	21 3*	21 3*	21 6*	21 9*	22 6	—
Durban Roads	—	15 0†	15 0†	—	15 0†	—
East Rand Centrals . .	11 0*	11 0*	—	11 0*	—	11 3*
East Rand Coals . . .	1 9*	1 10	2 0†	1 9	1 9†	1 8*
East Rand Deeps . . .	0 10*	0 10*	0 10*	0 10*	0 10	0 10*
E.R. Minings	—	—	—	11 6*	—	—
East Rand Props. . .	6 0*	6 0*	4 0*	5 6	5 6*	5 6*
East Rand Deb. . . .	—	£60	£62*	£62*	£62*	£62*
Eastern Golds	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
F. Smith Diamonds . .	3 4	3 3*	3 3*	3 4*	3 4*	3 5*
Geduld Props. . . .	35 9*	36 6†	—	36 6*	35 3*	35 6*
Ginsbergs	8 9†	—	—	7 6†	—	7 6†
Glencairns	1 0*	—	1 0*	1 0*	—	1 0*
Glencoe Collieries . .	9 0*	9 0*	9 0*	—	—	9 0*
Glynn's Lydenburgs .	15 3*	16 0*	16 3B	16 6*	16 0*	16 0*
Government Areas .	61 9	62 0	61 6	62 3	62 3	62 0*
J'burg Bd. of Exec. .	—	23 0*	—	—	—	—
Jupiters	3 6*	3 7*	3 6*	3 9*	4 0	3 9*
Knight Centrals . . .	3 1*	3 1*	3 1*	3 0*	3 2	3 1*
Knights Deeps . . .	—	15 0†	—	15 0†	15 0†	15 0†
Lace Props. . . .	4 4	—	4 3*	4 3	4 1*	4 0*
Leeuwoort Tins . . .	13 0†	11 0*	—	—	—	11 0*
Luipaardsvlei Est. .	2 6*	—	—	—	—	2 0*
Lydenburg Farms . .	6 7	6 3*	6 3*	6 6*	6 6*	6 7*
Main Reef Wests . .	3 6*	3 6*	3 3*	3 6*	3 9†	3 3*
Main Reef W. Debs. .	—	—	—	—	£30*	£45†
Middelvlei Est. . . .	—	1 0	—	—	—	1 0*
Modder B's	146 0	146 6*	145 6*	147 0*	117 6*	148 0*
Modder Deep	129 0	128 0*	130 0*	132 6*	133 0†	131 6*
Natal Navig. Col. . .	—	—	—	—	19 0*	—
National Banks . . .	—	—	—	£12*	—	£12 5
New Boksburgs . . .	1 3†	1 3†	1 3†	—	1 6†	1 6†
New Eland Diam. . .	27 0*	27 0*	—	28 0†	25 6*	25 9*
New Era Cons. . . .	—	8 9*	8 9*	8 9*	9 0*	9 0*
New Geduld Deeps . .	6 4*	6 4	6 3*	6 4*	6 4*	6 4
New Heriots	—	—	32 6*	32 6*	—	—
New Kleinfonteins . .	17 9*	17 9*	18 0*	18 0	18 0*	18 0*
New Modderfontein . .	—	£20 10s.	—	—	—	—
New Rietfonteins . .	1 0†	1 0†	0 6*	0 6*	—	1 0†
New Unifids	8 6*	—	9 6†	10 0†	10 0†	10 0†
Nigels	2 6*	—	2 6*	2 6*	3 0*	3 0*
Noorse Mines	18 3*	18 6	18 6*	18 9*	19 0*	19 0*
Pretoria Cements . .	89 0*	88 0*	—	88 0*	89 0*	90 0*
Princess Estates . .	—	—	2 0†	2 0†	2 0†	2 0†
Rand Collieries . . .	—	—	2 67B	—	2 0*	2 6†
Rand Klips	8 10	8 10*	8 8*	8 8*	8 9*	8 9*
Rand Nucleus	—	—	—	—	—	1 3*
Rand Select. Corp. .	72 6*	73 0*	73 0*	73 6*	73 6*	73 6*
Randfontein Deeps . .	4 3*	4 6†	4 9†	1 0*	1 3	4 9†
Randfontein Est. . .	12 6*	12 6*	12 6*	12 6*	12 6*	12 6*
Rooibergs	8 9	8 9*	8 9*	9 1	9 10	9 8
Shebas	0 11*	1 0*	1 0*	1 0*	1 0*	—
Simmer Deeps . . .	1 9*	1 9*	1 9*	1 11*	2 0*	2 0*
S.A. Lands	4 4*	4 5	4 3*	4 4*	4 4*	4 6†
Springs Mines . . .	59 3	59 3	58 6	60 3	59 6*	59 0
Sub Nigels	21 6	21 9	21 6	21 9	22 0*	22 6
Swaziland Tins . . .	25 0*	25 0*	25 0*	25 0*	25 0*	25 0*
Transvaal Lands . .	10 0*	10 0*	10 0*	10 0*	10 0*	10 0*
Trans. G. M. Est. .	15 6*	—	—	17 0*	—	17 0†
Van Ryn Deeps . .	60 9	60 6A	61 3	62 0	62 3	62 0*
Van Ryn Estates . .	35 0†	—	—	35 0†	35 0†	35 0†
Village Deeps	20 0*	20 0	—	19 6*	21 0*	20 6†
Village Main Reefs .	12 0*	—	15 0†	14 0†	14 0†	11 6†
Welgedachts	—	—	—	24 6*	—	—
West Rand Cons. . .	6 6†	6 6†	5 6†	6 0†	—	6 6†
Western Rand Est. .	1 9	—	—	1 0*	1 6*	—
Witwatersrand . . .	40 0†	—	—	35 0*	—	38 0†
Wit. Deeps	9 0*	8 0B	7 6*	7 6*	7 6*	7 6*
Wolhuters	7 6*	—	7 6*	7 10	7 6*	7 6*
Zaaiplaats Tins . . .	5 11*	5 10*	5 10*	5 9*	5 10*	6 0
Un' on 4 per cent . .	—	£52 15 6†	—	—	—	—
Un' on 5 per cent . .	Wed. 1st. £100 28.*	Thurs. 2nd. £102 54.*	—	—	—	—
Fri. 3rd. £103.*	Tues. 7th. £102 15s.	Wed. 8th. £102 10s.*	—	—	—	—
Thurs. 9th. £102.*	—	—	—	—	—	—

*Buyers. †Sellers. aOdd lots. bEx London.

Cape Diggings.**JUNE DIAMOND OUTPUT**

The following is a statement of the output of diamonds from the public diggings in the Cape Province during the month of June, 1917.

ALIWAL, NORTH

Area	No. of Diggers	Carats.	Value.
	16	882 $\frac{1}{2}$	£5,639 7 6
BARKLY WEST			
Bad Hope	3	6	30 5 0
Delpoort's Hope	35	200 $\frac{1}{2}$	1,316 12 6
Eland's Drift	21	190	1,090 10 0
Forlorn Hope	3	7	28 2 6
Gong Gong	51	341 $\frac{1}{2}$	2,676 0 0
Good Hope	49	237 $\frac{1}{2}$	894 12 6
Harrisdale	4	33 $\frac{1}{2}$	175 0 0
Hebron	140	719 $\frac{1}{2}$	4,737 7 6
Holpan	15	73 $\frac{1}{2}$	550 15 0
Jonas Kop	5	28 $\frac{1}{2}$	133 10 0
Keiskama	2	16 $\frac{1}{2}$	40 17 6
Klipdam	55	281 $\frac{1}{2}$	1,630 0 0
Klipdrift	40	132 $\frac{1}{2}$	651 9 6
Longlands	35	131	636 0 0
Niekerk's Rush	20	72	564 5 0
Rickett's Prospect	5	35 $\frac{1}{2}$	131 0 0
Rosalind	27	166 $\frac{1}{2}$	1,106 17 6
Scholtz's Prospect	29	116 $\frac{1}{2}$	757 5 0
Snyder's Rush	21	242	1,705 15 0
Union Kopje	2	5	28 0 0
Van Zoelen's Laagte	4	2 $\frac{1}{2}$	7 10 0
Waldeck's Plant	41	535 $\frac{1}{2}$	4,186 2 0
Ward's Hope	6	66 $\frac{1}{2}$	518 15 0
Winter's Rush	50	506 $\frac{1}{2}$	4,235 17 6
	666	4,147 $\frac{1}{2}$	27,832 9 0

Note.—The number of claimholders in the mining district of Barkly West during the month of June, 1917, was 1,319.

HERBERT.

Brypaal	11	19	110 12 0
Middeldrift	14	52 $\frac{1}{2}$	278 12 6
Platdrift	12	37	224 2 6
Schmidt's Drift	2	2	15 0 0
	39	110 $\frac{1}{2}$	628 7 0

KIMBERLEY.

Robinson's Kopje	7	79 $\frac{1}{2}$	827 5 0
Wedberg	14	88 $\frac{1}{2}$	842 2 6
	21	167 $\frac{1}{2}$	1,669 7 6

TAUNGS.

Killarney	—	—	—
PRIVATE ESTATES.			
Riverview Diamond Syndicate	—	104 $\frac{1}{2}$	1,028 5 0
New Vral River Diamond Syn.	—	2,308 $\frac{1}{2}$	14,897 10 0
Pniel Estate	—	290 $\frac{1}{2}$	2,202 5 0

Rose Deep.

The report of the directors of the Rose Deep for the quarter ended June 30 shows that the total footage done was 2,271; total footage sampled on reef, 1,955. The payable reef disclosures were as follows: Main Reef, 466 feet; width, 36 inches; assay value, 9·9 dwts.; Main Reef Leader, 53 feet; width, 24 inches; assay value, 7·7 dwts.; South Reef, 224 feet; width, 35 inches; assay value, 10·4 dwts.; Main Reef Leader and South Reef, 158 feet; width, 52 inches; assay value, 6·6 dwts. The unsatisfactory labour position resulted in a considerable reduction in tonnage output. The quantity of development work was therefore somewhat reduced to suit the circumstances. The profit for the quarter, in spite of labour difficulties, showed an improvement of £13,154, due to an increase of 1s. 2d. in yield and a reduction of 8d. per ton in working costs. In the absence of the publication of the new Income Tax Laws, the estimated sum to be paid has been based in the accounts on the laws in existence previously.

Tenders are being invited for diamond drilling underground by the Sheba Gold Mining Co., Ltd. Diameter of core may be from 5 in. upwards.

ANSWERS TO CORRESPONDENTS

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

- "Luknyn" (via Nylsland).—(1) Unlikely to recede much further—a fair lock-up. (2) The first and last-named.
- "Shareholder."—(1) 820 stamps and 25 tube mills. (2) Yes. (3) The water difficulty is being overcome.
- "Redderberg."—Doubtless true, and an official statement will be forthcoming shortly.
- "Interested."—The series of articles on the Pretoria iron ores will be continued next week.
- "Union."—The fusion of the two properties has often been discussed, but there is no reason to believe it is about to be effected now.
- "Bloemhof."—The quotation has been investigated and found correct. It remains good to-day.
- "X."—Your request has been complied with.
- "D. D."—Development is being continued, and a report will be issued in a few days.

Glynn's Lydenburg.

The following are the particulars of the Glynn's Lydenburg output for the month of July: Tons crushed, 4,300, yielding 1,443·1 fine ozs.; estimated value of month's output, £6,691; estimated profit for the month, £2,012. Profits were reduced by the temporary lock-up of about 200 ozs. of gold, which should be recovered shortly.



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THE JULY GOLD OUTPUT: GROUP RETURNS.

Rand Mines Group.

The following are the results of crushing operations of the Rand Mines/Central Mining companies for the month of July:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.	
Bantjes Cons. ...	90	3	21,530	5,466 *£3,252	24	1·5	
City Deep	1154	9	67,000	31,510	62,564	20	5·3
Con. Main Reef ...	110	3	25,590	9,843	11,437	23	0·9
Crown Mines ...	660	26	181,000	56,144	61,407	19	0·2
Dur. Rood. Dp. ...	100	3	28,000	8,957	3,619	24	0·2
East Rand Prop. ...	820	25	150,000	35,891	6,432	19	0·4
Ferreira Deep ...	280	7	43,330	16,251	16,154	23	8·7
Geldenhuys Dp. ...	300	7	55,000	15,571	9,011	20	3·2
Knight Central ...	117	3	26,500	6,665	1,337	19	11·1
Main Reef West ...	110	3	24,740	6,617	1,614	20	11·4
Modder B. ...	896	6	43,700	24,320	61,217	18	3·2
New Modder ...	180	7	53,500	28,032	64,768	19	4·3
Nourse Mines ...	180	5	41,400	13,301	8,411	22	7·9
Robinson	230	6	53,500	15,090	23,329	14	8·9
Rose Deep	300	7	58,400	16,888	23,392	16	3·6
Village Main ...	160	4	26,200	8,451	10,036	19	2·1
Wolhuter ...	120	4	34,000	10,091	11,751	17	9·6
Village Deep ...	180	7	54,800	19,872	20,704	22	7·3
Wit. Deep ...	240	5	33,520	9,401	3,035	21	5·2
Tls. & averages	4427	140	1021710	338,361	396,966	19	9·4

a Includes 4 Nissen stamps. b Includes 16 Nissen stamps.

* Loss.

The cost of incline shaft sinking, formerly charged against capital account, is now included in working costs.

Albu Group.

The July output of the producing mines of this group are as follows:—

Company.	Stamp.	Tons Crushed.	Total Cost.
Aurora West	80	15,100	£14,436
Meyer and Charlton ...	75	14,770	13,892
New Goch	120	20,400	16,432
Roodepoort United ...	75	23,722	26,975
Van Ryn Estate	140	36,200	28,640
West Rand Consolidated ...	100	34,310	31,370
	590	144,502	£131,145
Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 1·4	£18,345	£3,909
Meyer and Charlton ...	18/ 9·7	40,150	26,258
New Goch	16/ 1·3	19,478	3,046
Roodepoort United ...	22/ 2·8	26,606	231
Van Ryn Estate	15/ 9·9	44,412	15,772
West Rand Consolidated ...	18/ 3·4	33,114	1,744
	£182,105	£50,960	

Roodepoort United.—The greatly reduced tonnage, owing to shortage of native labour, resulted in decreased profit in spite of an improvement of 2s. per ton in the grade.

MINING EXAMINATIONS.

Study for Certificates as Mine Captains, Mine Managers, Surveyors, Mechanical and Electrical Engineers, and Engine Drivers. Private Tuition and Correspondence Lessons, where personal tuition is impracticable. Practical Mathematics and Electrotechnics. E. J. MOYNIHAN, Consulting Engineer, Cuthbert's Buildings, corner of Ellof and Pritchard Streets, Johannesburg, P.O. Box 2061.

Barnato Group.

The results of operations of the Barnato group for July are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	49,600	£61,910
Ginsberg	75	15,490	13,584
Glencairn	160	21,600	14,198
Government Areas ...	200	109,000	164,515
Langlaagte Estate ...	200	41,680	49,734
New Primrose ...	140	20,300	14,918
New Unified ...	60	13,750	13,617
Randfontein Central ...	600	167,493	205,696
Van Ryn Deep ...	80	42,650	92,562
Witwatersrand ...	215	40,800	48,036
Totals and averages ...	1830	522,363	£678,770
June totals ...	1930	526,196	£682,403
Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ...	£41,912	16·900	£20,171
Ginsberg	12,229	15·790	1,443
Glencairn	12,994	12·032	1,339
Government Areas ...	106,405	19·524	58,561
Langlaagte Estate ...	40,483	19·426	9,443
New Primrose ...	13,502	13·302	1,508
New Unified ...	9,617	13·988	4,046
Randfontein Central ...	168,519	20·123	38,502
Van Ryn Deep ...	40,932	19·194	52,560
Witwatersrand ...	33,482	16·413	16,077
Totals and averages ...	£480,075	18·381	£203,650
June totals ...	£483,050	18·360	£206,506

Monthly Gross Profit, 1917.—January, £282,859; February, £213,944; March, £225,477; April, £210,598; May, £200,264; June, £206,506; July, £203,650.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of July of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared.	Total Fine Ozs.
Simmer and Jack ...	320	7	60,600	16,366	£21,549
Robinson Deep ...	125	7	46,000	11,218	11,571
Knights Deep ...	400	11	93,100	15,166	*515
Simmer Deep ...	220	10	49,700	11,667	5,056
Jupiter ...	80	5	23,900	6,251	3,661
Sub Nigel ...	30	2	9,680	5,123	7,760
Totals ...	1175	42	282,980	69,091	£49,082

* Loss.

Reserve Gold.—Simmer and Jack, 4,600 ozs.; Simmer Deep, 1,270 ozs.; Sub Nigel, 2,466 ozs.; total, 8,336 ozs.

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,500; Robinson Deep, £4; Knights Deep, £145; Simmer Deep, £755; Jupiter, £587; Sub Nigel, £96; total, £3,417.

Knights Deep.—Operations for the month were seriously affected owing to the Connor shaft being out of commission for a full week, due to damage caused to shaft timber through accident to skip.

Sub Nigel.—The value of ore crushed was somewhat above normal.

Consolidated Mines Selection Group.

The following are the results of operations for the month of July.

	Stamps Working	Tons Milled.	Costs per Ton Milled
Brakpan Mines	100	55,000	20/- 4/38
Springs Mines	60	29,700	23/- 5/25
Totals and averages	160	84,700	21/- 5/30
Value of Gold declared.	Yield per Ton.	Profit per Ton.	
Brakpan Mines	£98,759	35 10 95	£42,756 15 6/57
Springs Mines	65,101	43 10 07	30,296 20 4/82
Totals and averages	£163,860	38 8/30	£73,052 17 3/00

Brakpan Mines.—The fixed charge for development has been reduced from 2s. 3d. to 1s. 9d. per ton milled as from 1st July.

PERSONAL.

The ninth annual meeting of the South African National Union will be held at the Carlton Hotel on Tuesday, the 21st inst., at 3.30 p.m.

* * * *

Mr. G. M. Clark, formerly of the engineering staff of the Victoria Falls Power Co., has been elected President of the S.A. Institution of Engineers for the year 1917-18.

* * * *

Another Rand pioneer passed away this week in the person of Mr. R. M. Connolly, the well-known director of mining companies. Mr. Connolly has been long and closely identified with the Rand, and his death will be mourned by a wide circle.

* * * *

The list of certificates issued by the Mines Department for the month ending 31st July, 1917, is as follows:—Mine Overseers' Certificates (Metalliferous): C. Bester, L. C. Blundell, G. H. Moll, R. J. Oelofse, W. Parry. (Coal): T. James, D. Thomas. Mine Surveyors' Certificates: F. J. Brink, H. S. McAlister, M. W. Meskin. Mechanical Engineers' Certificates (Mines): S. V. Applin, J. Fraser, W. L. Kerby, J. Lavis, G. A. Webb, A. H. S. Winton. (Works): A. Rodwell, F. Stott. Electrical Engineers' Certificate (Works): B. Sankey.

* * * *

The death is announced of Mr. George Rouliot, a director of the Central Mining and Investment Corporation, Ltd., formerly of Messrs. Wernher, Beit & Co., and for several years President of the Transvaal Chamber of Mines. Mr. Rouliot was a pioneer of Johannesburg. He came from Kimberley in the early nineties and became a partner in the firm of Messrs. H. Eckstein & Co. He was a member of the famous party that went to Rhodesia with Lord Randolph Churchill. He returned to Johannesburg soon after the military occupation in 1901, and chiefly through his instrumentality Lord Kitchener consented to the restarting of the mining industry, and after that Mr. Rouliot laboured assiduously in the work of restoration. When normal conditions were restored he went to London, and on the formation of the great Central Mining Corporation he became a director, resident in Paris.

* * * *

Goerz Group.

Results of operations on the producing mines of this group for the month of July:—

Company	Stamps	Tons Crushed.	Total Revenue.	Revenue per ton
Geduld Proprietary	... 80	37,600	£55,624	29/- 7
Modder. Deep Levels	... 70	41,000	81,130	39/- 7
Princess Estate	... 60	22,200	28,360	25/- 7
Totals	210	100,800	£165,114	—
Company.	Total.	Per Ton.	Total.	Per Ton
Geduld Proprietary	£35,587	18/11	£20,037	10/- 8
Modder. Deep Levels	33,459	16/- 4	47,671	23/- 3
Princess Estate	27,084	21/- 5	1,276	1/- 2
Totals	£96,130	—	£68,984	—

Another member of the staff of the Mines Department has given his life in the war. News was received in town last week that Captain Leonard Herbert Wilson, of the 8th S.A.I., and of the Mines Department staff, was killed in action in East Africa on the 19th ult. The late officer was born in London in 1875, and was educated at the Grammar School and College, Auckland, New Zealand. He came to South Africa with the New Zealand Contingent during the Anglo-Boer War, and before its close joined the Public Works Department as a mechanical engineer. In 1908 he was appointed Assistant Inspector of Machinery in the Mines Department, and was promoted to full Inspector in 1912. When the present war broke out he was in charge of the machinery work of the Krugersdorp district, and volunteered at once for active service with the Union forces in South Africa. He served with distinction through the South-West campaign and right through the campaign in East Africa until his death in action last month. He leaves a widow and two children. He is the third inspector of machinery who has made the supreme sacrifice.

Questions of interest to the diamond industry were put in the House of Commons last week by Alderman Kiley (Liberal, Whitechapel). He asked the Board of Trade whether members of the diamond import and export committees possessed expert knowledge, and were capable of determining the place of origin of rough stones, and particularly whether such stones were of enemy origin. Commander Leverton Harris gave a reassuring reply. Mr. Kiley further asked "whether the Board of Trade was aware that, except as to certain yellow diamonds from German South-West Africa—which were distinguishable by their colour—it was not possible to determine whether the rough stones were of enemy origin or not, or that the former test of stones cut by a Belgian workman, employing the Antwerp cut, was no longer distinguishable from stones cut by Dutchmen using the Amsterdam cut, by reason of the fact that at the outbreak of war numbers of Belgian workmen employing the Antwerp cut emigrated to Holland and many to Great Britain, where they had since pursued, and continued to pursue, their calling as diamond cutters, and rendered the former test unreliable and unsatisfactory; whether the Board of Trade would now discontinue it as a justification for seizure and condemnation of stones imported from Holland." Commander Leverton Harris, in reply, said: "It is always open to owners of goods seized to dispute such when proceedings for condemnation will follow. In such proceedings experts' views regarding the origin of such diamonds form part of the evidence laid before the Court, and the defence is naturally at liberty to submit export or other evidence to rebut such views, if they think fit."

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Controlling Underground Air.

To the Editor, *South African Mining Journal*.

Sir,—Through your valued columns allow me to state that, although the last report of the Miners' Phthisis Prevention Committee shows that great advances have been made in staying the spread of phthisis and freeing the underground workings of the mines of dust and fumes, there still remains much to be done before the safe horizon is reached and the miners able to go underground without the fear and dread of contracting the harrowing and fatal complaint. The report indicates that all known protections and preventions that can be practically employed have been tried and exhausted, and that to-day the position stands that all miners suffering in a dangerous stage of phthisis are debarred from going underground, and that ample usage of water, dry compressed air, and artificial ventilation is made use of to effect what is termed a satisfactory condition in compliance with the Mining Regulations which provide for an air test every three months over each mine. For a humanitarian reason, and in hope of better and more profitable working of the mines generally, I would suggest: (1) That in all working places a small cabin or breathing chamber be partitioned off in the stope, drive, or safe place for the miners to occupy during lunch time, making up his charges, marking boys' tickets, and returns for the day's shift, and other spare time, such place to be secure from all dust and mine fumes and supplied with free air by compressed air jet or other suitable and practical means. One reason for this is that it is generally about the middle part of the shift that the hustling and strenuous work is completed and a certain amount of fagging sets in and the breathing passages of the lungs are congested and require cleansing out and filled with a good supply of pure air, in order to assist them back to a normal condition. He has no chance of breaking the shift and coming to the surface to do so. This is the time when vitality is lowering and the critical stage when toning up by pure air is essential to the miner to maintain his lungs in a fit physical state to combat against phthisis with a fair fighting chance to continue to the end of the shift in an efficient manner, and become refreshed and contented, and induce others to do likewise. (2) Similar place or places should be provided for natives and controlled by boss boys while there. (3) Natives should be trained to make a break in the shift and be supplied with some hot drink and food to stay them to

the end of the shift (this is suggested by the report). In no place in the world, as far as I know, where similar work is done by white labour is it performed without a break for at least twenty minutes in the shift, for what is generally known as "crib time," and it is nothing short of inhumane and bad policy to permit and encourage natives to continue to do so. A trial of some kind should be made, and I think it will be found that instead of losing time by the small respite a gain of footage and work done will result and act as an inducement for the natives to remain for longer periods working on the mines, and particularly the deeper mines. (4) That the air supplied to the chambers be pure or filtered to purity and that cylinders or special inhaling apparatus be placed therein containing suitable curative fumes or fumes that would assist in cleansing and strengthening the lungs—and the same to be available in the change house when coming off or going on shift, so that the worker inhale some preventive before and after the shift. The ancients, I believe, used the fumes from pine and burrwood. I do not suggest that this is going to stop phthisis. Something more elaborate must be adopted; but I do think that at least 30 per cent. additional life will be given the underground worker and more efficient work will accrue from him and the native from it. For instance, take a fast drilling hammer boy: he finishes his hole and out of the mine by half the shift, but given, say, half an hour to refresh himself in the chamber and he becomes fit to continue and drill another hole or more. Then again a definite and sure amount of pure air would be under absolute control at any temperature on every mine from one end of the reef to the other, and as temperature will be a question in the deeper levels, it, or other more expensive measures, will sooner or later have to be adopted. Finally, the Government should contribute to the cost of installation, as I honestly believe that there would be less patients in the Sanatorium and more healthy and contented miners on the Reef arising from it. The American Government spent some £5 000,000 in exterminating a mosquito and cleansing the Panama Canal zone of fever, in order that the great scheme could be completed, and surely it is up to the Government here to contribute—and contribute liberally—in assisting to bring and maintain the sheet anchor industry of the country to the highest point of efficiency in saving the lives of men from phthisis.—Yours, etc.,

S. PHELPS.

Benoni, 6th Aug., 1917.

The Lonely in June.

The following are particulars of the output from the Lonely Mine for the month of June: Mill ran, 684 hours; crushed, 4,560 tons; fine gold recovered, 1,269·776 ozs.; value, £5,338 10s. 4d.; slimes treated, 4,560 tons; fine gold recovered, 3,158·853 ozs.; value, £13,283 0s. 11d.; total recovery of fine gold, 4,428·629 ozs.; total value, £18,621 11s. 3d.; profit, £9,086 18s. 4d.

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Transvaal Gold Mining Estates.

The following are the particulars of the output of the Transvaal Gold Mining Estates for the month of July:—Central Mines: Tons crushed, 18,150, yielding 5,722·4 fine ozs. Elandsdrift Mine: Tons crushed, 1,425, yielding 903·4 fine ozs. Vaalhoek Mine: Tons crushed, 2,060, yielding 711·2 fine ozs. Estimated value of month's output, £30,460; estimated profit for the month, £9,688.

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WHAT THE RHODESIAN MINES BUY.

The following table of Rhodesian imports of mining material and stores principally used for mining purposes, during 1914, 1915 and 1916 is taken from the Rhodesian Customs returns. The list shows the value, at place of purchase, of the imports of the principal mining material and stores into Southern Rhodesia:

	1914.	1915.	1916.	1914.	1915.	1916.
Vaid, Sulphuric	£2,605	£2,676	£2,878	Galvanised, Corrugated	24,866	12,613
Assay Apparatus	6,418	7,042	7,872	Pig and Ingot	258	414
Blasting Compounds and Dynamite	69,512	80,808	89,711	Pipes and Piping	20,502	9,266
Borax	2,470	2,881	3,711	Plate and Sheet	2,481	4,387
Candles	23,250	22,089	36,352	Lend—		
Caustic Soda	437	294	816	Bar and Sheet	191	83
Cement	8,972	2,738	1,124	Foil and Acetate	1,726	3,976
Coal, Coke and Patent Fuel	453	263	593	Pipes and Piping	28	35
Composition, Boiler	425	309	320	Lime	5,068	7,095
Composition, Metal	1,429	2,552	3,625	Litharge	925	585
Copper, Plate and Sheet	812	340	916	Machinery—		
Copper, Bar	2,747	1,746	36	Bands and Belting	18,968	14,880
Cyanide of Potassium	806	20	695	Buckets and Trucks	3,980	2,216
Cyanide of Sodium	59,327	69,189	70,492	Electrical	20,714	5,758
Detonators and Fuse	18,305	14,384	31,712	Mining	137,002	78,721
Electric Fittings	15,862	7,575	8,719	Packing	3,595	4,422
Fire Bricks and Clay	237	185	238	Parts	21,813	14,048
Grease, Antifriction	4,195	4,426	5,605	Pumps	10,901	6,978
Iron and Steel—				Oil—		
Angle, Channel, and T	833	518	246	Castor	2,006	1,655
Bar, Bolt and Rod	13,670	13,874	17,568	Colza	18	6
Chains	1,018	925	1,239	Lubricating	13,246	14,210
Girders, Beams, Joists	6,561	2,216	741	Quicksilver	3,558	4,019
Galvanised	2,906	2,267	2,446	Tramway Material	1,398	658
				Waste, Cotton	1,314	1,693
				Wire Rope	3,563	2,989
				Zinc	12,072	20,117
					<hr/>	<hr/>
					£575,467	£465,198
						£557,813

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Engineering Notes and News.

Engineering Standards.

In the course of his "James Forrest" lecture, before the Institution of Civil Engineers, Sir John Wolfe-Barry announced that the Government has decided to give substantial support to the work of the British Engineering Standards Committee. The new Treasury grant will amount to £10,000 per annum, and will be supplemented by grants from engineering firms totalling a further £13,000, thus placing the finances of the committee for the first time on a really satisfactory basis, and permitting the multitudinous reports, covering every branch of engineering work, to be sold—as are the similar reports of the Bureau of Standards—at a uniform price of Is. each. Moreover, the new grant will permit of all the British standard specifications being translated into the French, Spanish, and Russian languages. With the object of still further facilitating British engineering trade abroad the Government have approved the proposals of the British Engineering Standards Committee to set up local committees of those interested in the engineering and allied trades in the Argentine, Brazil, Chili, China, Peru, Portugal, Russia, Spain, Uruguay, and other countries, with the British Consul as chairman of the local committee in each country. This development will meet a crying need in British engineering.

Splitting Diamond-Drill Cores

A drill core is one of the best exploratory records that can be had, for the reason that it shows in relative position the various formations that have been passed through by the diamond drill. The drill core gives a geologic history, and its careful preservation is therefore a matter of great moment, especially when the cost of securing the core may have been from 12s. 6d. to £1 a foot. In drilling through mineralised zones it is important to know the mineral content of the core; still one is reluctant to grind the core to pulp, for the reason that its usefulness as a geologic record is thereby destroyed. It is obvious that if the core can be split longitudinally, one-half will serve as a complete geologic record and the other, if ground, will furnish a sample of the rock that has been drilled. The geological and mechanical departments of the E. J. Longyear Co., of Minneapolis, Minn., have developed a machine (of which illustrations appear in the New York *Engineering and Mining Journal* of 19th May) for the purpose of splitting diamond-drill cores. The core splitter has been tested out thoroughly, and a number of them are now in use by this company in its various diamond-drilling operations. With care even the most schistose rocks may be split accurately. The machine consists essentially of a stationary and moveable knife-blade set in an iron frame. The stationary blade is clamped between guides, and the moveable one is attached in such a manner that by means of a rack and pinion the upward and downward motion of the blade may be controlled by a hand lever. Splitting is accomplished by striking the top of the ram a sharp blow. This will split the core longitudinally. The side bars are then pulled out to allow the halves to drop. Four springs hold these side bars in position against the frame. An adjustment is provided to accommodate cores of different diameters. The adjustment is so arranged that the two side bars (one on each side) move toward or away from the plane of the blades simultaneously. This is essential in order to have cores of

different diameters held in position between the knife-blades so that they will be divided into "equal halves." The device is a useful addition to any diamond-drilling equipment.

Maritzburg Municipal Power Plant.

In his Mayoral Minute the Mayor of Pietermaritzburg states that the Borough Electrical Engineer reports that the progress during the last year has been extremely satisfactory, the number of new consumers connected to the mains being considerably above the average. The revenue derived from the sale of current shows a substantial increase, while the expenditure, in spite of the considerably enhanced cost of material, has been kept within the limits of the Estimates. The plant generally has run through the year without interruption, and has maintained its record for efficiency. Owing to the high cost of paraffin at the present time, a considerable number of additional consumers have been connected up with the mains, and the additional load from the source has had to be met by running the old reciprocating plant in addition to the turbine. The gravitation water scheme, which carries the water direct to the condensers without the necessity of pumping, has been completed, and has proved an unqualified success. Additions and improvements have been made to the lighting of the thoroughfares in various parts of the town and suburbs. During the year the question of installing additional generating plant to cope with the growing output of current has been under consideration; specifications have been prepared by the Borough Electrical Engineer, and tenders called for this plant. Owing, however, to the restrictions placed by the Minister of Munitions on the manufacture of electrical plant for export, it is most unlikely that this plant will be available until after the termination of the war.

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298. Arthur Wilzin.—Improvements in automatic glass gathering and blowing machines.
299. Charles Edward Blyth and Lister Lister Kaye.—A new or improved method of and means for the transference of loose material.
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THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

A Broken Week—Enquiries Started Well After the Holiday—Reef Travellers Uneasy—Motor Spirit and Paraffin—Shop Tools Scarcer—Employers and Employees.

THIS has been a broken week and a very unpleasant one. The wholesale houses closed from Saturday, August 4th, the war anniversary, over the popular Bank Holiday of Monday, re-opening on Tuesday with bright sunshine. However, on the Wednesday Johannesburg experienced a very bad day, as the snow, sleet and wind not only cleared the streets but most offices at midday as well. On the opening of the Commercial Exchange on Tuesday there were more enquiries than for a long while past, but it was very flat on the Wednesday. The chief buying office is getting busier on the Exchange, and the information obtained is that they are daily expecting returns from the only two outstanding mines, and immediately these are received the chief buying administration will control about half the imported supplies. In this respect a Reef traveller states that even now it is almost impossible to do any business on the mines, as the storekeepers are not easy of approach, presumably because they do not wish to trespass upon the pooling scheme arrangements. If this is the case in the preliminary stages, he remarked, what will it be when the whole scheme is complete?

SHIPPING AND SUPPLIES.

There is a better feeling as regards obtaining supplies, not exactly immediately but in October when substantial additions are expected from new ships. The advices from America are conflicting, as some importers who had been promised shipments have received cables that the ships had been diverted to other routes, whereas other advices have been more promising. The British advices are much the same, but none give any definite information; however, the vein running through the various advices is on the hopeful side. Our old friend Reuter also gives some very promising

news that a standardised vessel of 8,000 tons has just been launched in the United Kingdom and the very description itself shows that there are others to follow.

IRON AND STEEL.

The continued search throughout South Africa for scrap iron and steel for foundry purposes now and again results in unearthing material which had been discarded. Under this heading one firm in Johannesburg raked up £200 worth of material, and no doubt there are other similar finds. Thanks to the local product of iron, and in a lesser degree steel, which is relieving the acute position owing to the scarcity of the imported article, merchants holding fair stocks state that there is anything but pronounced demand as the commercial people are more careful and the mines have excellent supplies. The advices from Britain state that the measures which have been taken under Government assistance to add to furnace capacity have assisted the position as regards the output of pig iron. However, the general position is that early delivery is extremely difficult to secure, for makers have apparently nothing to sell. The forward demand is very brisk, but manufacturers are disinclined to book orders for delivery beyond November

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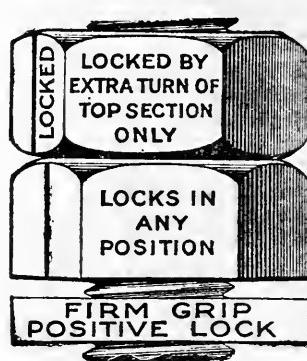
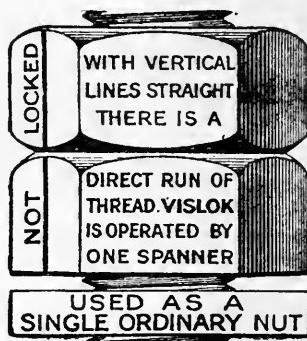
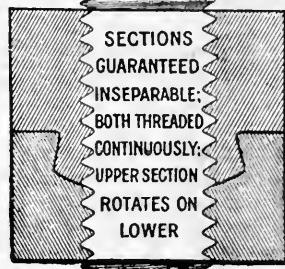
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-------------------------------------------------------------------------	------------------------------------------------------------	------------------------------------------------------------------------------------

until the size of future requirements can be more approximately ascertained. New export business is more restricted, permits being hard to get, though every consideration is being given to the urgent requirements of France. However, the position is anything but hopeless, thanks to the judicious husbanding of resources, whether in crude iron or steel material for months past, and it is generally recognised that operations are proceeding as well as could be reasonably expected, making allowance for the many difficulties which have to be contended with. Whilst the shippers are very diffident about forecasting supplies for South Africa, their communications both by letter and cable show a little more optimistic vein, but so far nothing more can be said, as it seems out of the question to pin them down to anything like a positive promise.

MOTOR SPIRITS AND PARAFFIN.

Although motor spirits have been put up 1s. per case and paraffin 6d., the causes did not supervene all at once but were the result of petty accumulations, such as the extra cost of the tins and cases, as well as a trifling advance on motor spirits in America. It is not easy to form an opinion about South African stocks, but it is safe to venture a statement that they are still satisfactory. But it is quite safe to say that holders could sell all out to speculators and to big users very quickly, but they have not only their contracts to fulfil but their regular customers to look after. As regards future supplies from America, there seems to be no real anxiety at present, but hopes rather that the shipping position will be relieved by the end of the year, or before. When judiciously pressed for a little news, a representative remarked: "That is just what we are looking for, as the position seems one of suspense through lack of information. Nevertheless we feel that our people on the other side would cable us if the occasion required, as the mails are irregular and uncertain."

LOCAL EFFORTS.

There are many indications that Johannesburg is helping itself more than ever. For example, the rubber industry is gradually doing much outside the motor requirements, for the commercial world and the mining industry. The Germiston factory anticipates being able to place carbide on our market within a month or six weeks, and all users hope it will be a success, as the present price of from £100 to £120 per ton is getting prohibitive. The farriers are making more and more horse shoes, especially when they get suitable iron. And the foundries and engineering shops have more work than they can get through.

THE WORKERS AND EMPLOYERS AFTER THE WAR.

At a recent meeting at Birmingham of a big industrial concern, the managing director said that the war had rendered extremely urgent the great problem of establishing a better understanding between employers and employed. The position was a difficult one, calling for wisdom and self-restraint on both sides, but those who were so placed as in some measure to feel the pulse of things knew that there was a new spirit stirring among both classes of the industrial community, which there was reason to hope would lead to mutual confidence based on equitable conditions. Both sides were coming to recognise two essentials—that on the part of the workers there must be the removal of all artificial restrictions upon maximum output, on that of the employers, while abnormal rates of pay due to the war obviously could not continue in time of peace, yet there must be adequate remuneration to the workers, so as to ensure to them not only the comforts of life, but what is more important, a proper degree of security with regard to their future. To meet the new conditions there would be the great necessity for speeding up and increasing output. The great necessity for that increase of output was shown by authoritative figures recently published indicating that in the twenty-six leading industries in Britain and the United States, there is not one in which the value of production per wage-earner per year is not substantially larger

in America than in Britain, and in that country both employers and the working classes are generally more well-to-do than in Britain. Another condition important to a mutual understanding between capital and labour was that means must be taken to ensure that bargains between employers' associations on the one hand, and trades unions on the other, should be honourably carried out by both.

SHOP TOOLS, LATHES, ETC.

There is a great scarcity of engineering shop tools, lathes, and such like, as well as worn-out spares of all kinds. The explanation is simple, as nothing much is coming forward to replace the ordinary consumption. In this respect the second-hand dealers are doing better business in ordinary tools, but the spares for machinery, particularly the larger kind, are getting acutely scarce. In a visit to an engineering shop it was surprising to notice what a lot of splicing and patchwork repairs had been done to keep the machinery going, and so avoid hanging things up whilst a new casting was being made.

AGRICULTURAL MACHINERY AND PIPING FOR IRRIGATION.

The second-hand machinery dealers say that their best customers just now are the farmers, as decent second-hand engines are in demand for pumping and irrigation purposes, also for power required on the larger farms. Enquiries for piping come to hand from all parts, and the scarcity must enable the yards to clear out much of the stuff usually cut up for fencing standards, as in many cases there is little or no pressure for carrying water for irrigation purposes. During the past ten days a big parcel of 3 in., 4 in., and 6 in. piping came into the market, and it was all quickly absorbed and more asked for. The recent rains and snow have created an active demand for ploughs, scarifiers, harrows, etc. Dairymen are also well in the market, as well as poultry fanciers.

VARIOUS TRADE ITEMS.

Anything containing an alloy of copper is on the British prohibitive list. Rhodesian orders have slackened off lately, but the Natal collieries have sent more orders, particularly for pumps and their spares. There is much the same demand for timber, but oversea news is scarce in that direction. The absence of information about galvanised iron expected from America is tantalising to those contractors who are waiting, and have been promised week after week that a shipment is expected at the coast every day. Battery screenings are rising in price, which should be good news to the local makers. Electrical accessories are also being made here for parts which are required in cases of emergency, but on the whole electrical work requires special fine machinery. A short time ago Capetown could be drawn upon for much electrical material, but now it is not unusual for enquiries to come from there. Oils and paints are much

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the same, but an acute position is anticipated before the end of the year in the matter of white lead and linseed oil. Complaints are made that there is too much speculation in easily stored commodities, hence the word profiteering is occasionally heard.

REVISED PRICE LIST.

Iron, imported, $\frac{1}{4}$ round, 40s. to 55s.; $\frac{1}{2}$ up to 1 in., 37s. 6d. to 50s.; 2 in. to 6 in., 30s. per 100 lbs. Ditto, square, $\frac{1}{4}$ up to 1 in., 30s. to 45s.; $\frac{1}{2}$ in. to $\frac{3}{4}$ in., 25s. to 30s.; $\frac{3}{4}$ in. to 5 in., 25s. Flats, 3-16 in., 40s.; all from $\frac{1}{4}$ in. up, 50s. Angles, $\frac{1}{4}$ in. to 3-16 in., 37s. 6d. to 40s., all sizes; $\frac{1}{4}$ in., 37s. 6d.; $\frac{1}{2}$ -16 in. to $\frac{3}{4}$ in., 35s., excepting 5 x 4 x $\frac{3}{8}$ in.; mild steel bar, 5*lb*. lb., drill, 1s. *lb*; steel plates, 10 ft. by 4 ft. by 1-16 in., 62s. 6d.; $\frac{1}{4}$ in. by 3-16 in., 62s. 6d.; $\frac{1}{4}$ in. to 5-16 in., 60s.; $\frac{3}{8}$ in. up to 60s.; 10 ft. by 5 ft. by 1-16 in., 60s.; $\frac{1}{4}$ in. and 3-16 in., 60s. to 62s. 6d.; $\frac{3}{8}$ in., up to 57s. 6d.; intermediate sizes up to 12 ft. by 6 ft. by 1-16 in., 57s. 6d.; $\frac{1}{4}$ in. and 3-16 in., 60s.; $\frac{3}{8}$ in. and 5-16 in., 60s.; $\frac{1}{2}$ in., and up, 57s. 6d., all at per 100lb.; hexagon and cuphead bolts, 4*lb*. dia., 1s. 9d. lb.; $\frac{1}{2}$ in. dia. up to 3in. long, 1s. *lb*; $\frac{1}{2}$ in. dia., 11d.; $\frac{3}{4}$ in. and up long, 11d. *lb*; $\frac{1}{2}$ in. dia. up to $\frac{2}{3}$ in. long, 62s. 6d. 100lb.; $\frac{1}{2}$ in. dia. up to 2*lb*, 55s. 100 lbs. $\frac{1}{2}$ in. dia., 2*lb*, and up long, 52s. 6d. 100 lbs.; $\frac{1}{2}$ in. dia., 2*lb*, and up long, 50s. 100 lbs.; $\frac{1}{2}$ in. and 1*lb*. dia., same price as $\frac{1}{2}$ in. diameter; nuts, $\frac{1}{2}$ in., 1s. 3d. *lb*; $\frac{1}{2}$ in., 65s.; $\frac{1}{2}$ in. to 1*lb*., 62s. 6d.; $\frac{1}{2}$ in. and 1*lb*. 70s.; $\frac{1}{2}$ in. to 1*lb*., 75s.; 2*lb*, up, 88s.; washers, all sizes, 45s.; rivets, 3-16in., 1s. 6d. *lb*; $\frac{1}{2}$ in., 5-16in., 1s. 3d. *lb*; 7-16in., $\frac{1}{2}$ in., 9*lb*. *lb*; $\frac{1}{2}$ in., 52s. 6d.; $\frac{1}{2}$ in., 55s.; $\frac{1}{2}$ in. up, 49s. 100 lbs.; shoes and dies, 32s. 6d. to 30s. per 100 lbs.; rails, £25 per ton; picks, 4*lb*. 27s. per dozen; shovels, 32s. 6d. to 55s. per dozen; drill hammers, 5*lb*. to 6*lb*. per *lb*; hammer handles (best American), 14*lb*. 3s. 6d., 24*lb*. 7s., 30*lb*. 9s. 6d., 36*lb*. 13s. per dozen; metal, anti-friction, 1s. per *lb*; galvanised iron, 24 gauge, 6 ft. to 10 ft., 2s.; 11 ft., 2s. 1d., 12 ft., 2s. 2d.; 26 gauge, 6 ft. to 8 ft., 1s. 6d., 9 ft., and 10 ft., 1s. 6d.; flat galvanised, 18 to 24 gauge, 115s.; 26 gauge, 110s. 100 lb.; floor brads, 40s.; ceiling, 42s. 6d.; wire nails, 45s. to 55s. per 100 lb.; solder, 50 per cent., 4s. per *lb*; locks, rim, 66s.; mortice, 70s. per dozen; barbed wire, 4*lb*. per 100*lb*. coil.

Timber: Deals, Baltic, 9 x 3, 1s. 3d. to 1s. 4d.; flooring, $\frac{1}{2}$ x $\frac{1}{2}$ and 6 x $\frac{1}{2}$, 7*lb*. to 8*lb*. per sq. ft.; do., $\frac{1}{2}$ x $\frac{1}{2}$, 1*lb*, 9*lb*.; and 6 x $\frac{1}{2}$, 9*lb*.; ceilings, 6 x $\frac{1}{2}$, 4*lb*. to 4*lb*. per square foot; pitch pine, 8s. to 8s. 6d. per cubic foot; Oregon, 6s. 3d. to 6s. 6d. per cub. ft.; clear pine, $\frac{1}{2}$ in. x 12 in.,

10*lb*. per ft.; lim. x 12in., 1s.; teak, 15s. 6d. per cubic foot; jarrah, 9s. 6d. per cub. foot; poplar, lim. x 12in., 1s.; scantling, 1s. 3d. to 1s. 3*lb*. per ft., 3 x 9.

Bricks, cement, lime, etc.: Pretoria Portland Cement, 9s. 3d. per bag; 8s. 3d. truck loads; lime, white, unslaked, 1s.; truck loads, 6s. slaked, do., 5s.; blue, 3*lb*.; plaster lime, 4s.; bricks, stock delivered, 37s. 6d. to 15s.; wire cuts, 50s. to 70s.; pressed, 70s. to 80s. per 1,000, road transport difficult to obtain; salt and white glazed bricks, £27 ixs. per 1,000; roofing tiles, £25 per 1,000; Ronan do., £12*lb*; glazed tiles, 10s. 6d. to 17s. 6d. per yard; paving cement tiles, 8s. 6d. per yard laid; reinforced concrete columns, 6 ft. plain, 22s. 6d.; fluted, 24s.; fireclay bricks, £7*lb* to £9*lb*, at kiln, per 1,000; clay chimney pots, 36s. to 70s., according to height, 12 in. to 18 in., per doz.; fire clay, 37s. 6d. per ton on rail.

Oils, paints, lead, oxide, glass: Linseed, raw and boiled, 45s. per five gallons; white lead, 1s. per *lb*. (big lots not quoted); turpentine, 57s. 6d. 2*lb*/4 gallons; 10*lb*, 62s. 6d.; oxide in oil, 36s. per 100*lb*.; dry oxide, 22s. 6d. to 27s. 6d.; linseed oil putty, 4s. 9d. per 12*lb*. lbs.; bladders, 38s. 6*lb*. casks of 100*lb*.s.; grease, A F. axle, 26s. 6d. to 28s. 6d. per 100 lbs.; tallow, 1s. per *lb*.; White Rose paraffin, 18s. 9d. 2*lb*./ Laurel do., 18s. 6d.; petrol, 30s. 6d. 2*lb*./ motor oil, 7s. to 7s. 9d. per gal.; engine lubricating oils, 27s. to 40s. per case; cylinder, 26s. 6d. to 42s. 6d.; paints in tins, 1s. per *lb*.; British plate-glass, 4*lb*. in. 3s. 9d. to 4*lb*.; mirror, 5*lb*.; window, 16 oz., 1s. to 1s. 3d. ft.

Chemicals: Mercury, £55 to £60 per 75*lb*. bottle last sale, but now no definite price; bichlorate potash, 5s. 6d. *lb*; chlorate, 4s. 6d. per *lb*; permanganate, 14s. 6d. *lb*; alum, 6d. *lb*; carbolic acid, 7s. 6d. *lb*; borax, 92s. 6d. 100 lbs.; cyanide soda, 1s. 5d. *lb*; hypo, 9d. *lb*; acetate lead, 77s. 6d. 100 lbs.; litharge (assay), 72s. 6d., (commercial) 58s. 6d. 100 lb.; zinc sheets and blocks, 1s. 9d. *lb*; plumbago crucibles, 5d. per number.

Electrical goods: Lamps, high volts, British, Holland, and American, 36s. wholesale, and 54s. dozen retail; carbon lamps, 10s. 6d. dozen; pure rubber flex, 6d. to 8d. per yard; 3/20 coils of wire, 30s. to 33s.; do., 3/22. 23s. 6d.; tubing, 18s. to 20s. 100 ft.; keyholders, 6s. to 7s. 6d. each; round blocks, 3*lb*. in., 3s. 6d. doz.; lamp holder cord grips, 13s. 6d. to 15s. per dozen; switches, 5 amp., 24s. to 30s. doz.; British glass shades, 30s. to 40s. dozen; porcelain shackles, 15s. to 18s. dozen; do., bobbins, 12s. 6d. to 14s. per 100; cleats, 20s. per 100; P.O. insulators, 18s.; motor, 3 h.p., about £35 to £37, r.c.w.

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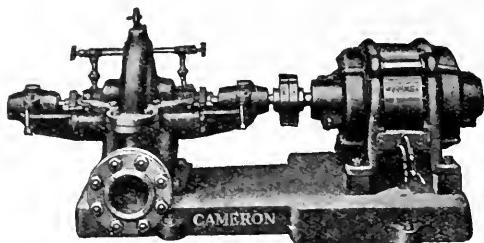
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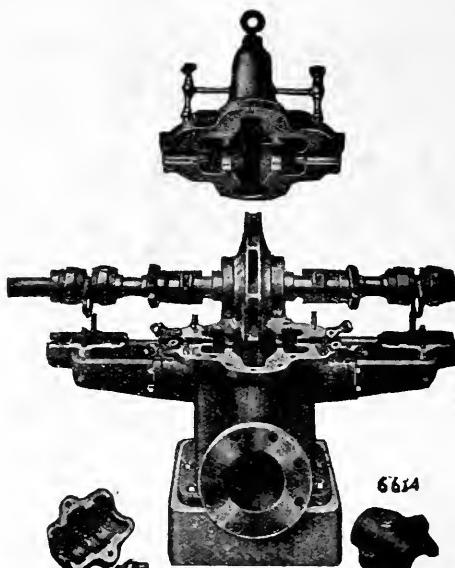
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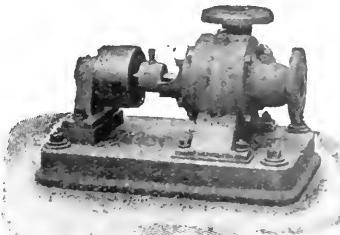
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Company Meetings.

NEW ELAND DIAMONDS.

The fifth ordinary general meeting of shareholders in the New Eland Diamonds, Limited, took place on August 3rd in the board room, Cullinan Buildings. Sir Thomas Cullinan presided.

The Chairman said that washing had only been resumed during the latter end of July, so that any comparisons were difficult and only misleading. The actual profit for the five working months was £4,372 10s., but from this must be deducted £3,704 12s. 10d. for expenses. These figures did not disclose any startling progress, but allowances must be made for the extraordinarily high cost of mining requirements. The only pleasing feature was the price obtained, namely, £1 15s. 1.8d. per carat, while the stones sold this year up to June 30 had improved on this figure. Liabilities had been considerably reduced, and, taking the diamonds won during last month into account, they were only £5,750 on the wrong side at July 31. The lease with the Government for the

first period of five years expired on May 28. Application had been made for renewal, and they were assured that they could expect a renewal on the same terms as granted by Government to the Blaauwbosch Diamonds Company. Under the old lease they were paying the Government claim licences and a royalty on the number of loads washed. They were led to understand that the terms of renewal would be on the basis of 15 per cent. on the profits, which was to cover everything. This 15 per cent. was about equal to what they had been paying.

Relying to questions, the Chairman said the renewal would be granted in the near future. He expected that when the company's haulage was down to the 920 feet level the tonnage indicated in the last annual report would be obtained. A pleasing feature disclosed by the development at this level was the indication that the mine, instead of contracting, was expanding. With regard to the diamonds, the percentage per 100 loads remained about the same, a feature being the finding during the past three months of a larger number of

stones of over 10 carats. One stone in particular, which unfortunately happened to get broken, when pieced together, would have been an 80 carat. The cost per load washed for the working period under review was 4s. 7.01d., and including the extraordinary expenditure a further 1s. 4.45d. Since then the costs had been reduced, although he did not anticipate getting down much below 3s. But on this basis, and taking the value per load at 6s. 3d., they should have a fair margin for distribution. The gear had been working very satisfactorily. The capacity they were aiming for was 800 loads per diem, which they anticipated reaching in the near future. No further capital expenditure was contemplated for the purchase of new plant. In the near future shareholders might anticipate a dividend. Since they restarted they had paid off a large proportion of the debt, having been heavily in debt at the date of the last meeting.

The report and accounts were adopted.

Sir Thomas Cullinan and Mr. W. T. Cullinan were re-elected directors.

Mr. A. A. Cassidy, the retiring auditor, was reappointed.

Rooiberg Minerals.

The report of the directors of the Rooiberg Minerals Development Company for the quarter ended June 30 shows a declared profit of £13,636 19s. 6d., no allowance being made for direct taxation. The average price per ton of metallic tin on which the quarter's revenue has been determined is £206 4s. Number of stamps, 10; number of days concentrating plant ran, 83·15; ore treated, 10,311 short tons; concentrates produced, 265 long tons; average assay value of concentrates, 67·87 per cent. metallic tin. Capital expenditure: Additions to slime plant, £1,268 18s. 11d.; development of mine in depth, £2,062 19s. 4d.; total, £3,331 18s. 3d. In the last quarterly report it was stated that recent exploration and development work had failed to locate profitable ore bodies to any considerable extent, and that it was becoming increasingly difficult to provide the mill with the tonnage necessary to keep it working at full capacity. It is anticipated that during August milling will have to be considerably reduced. The slime plant, however, will be kept at full capacity re-treating stock slime. A vigorous programme of exploration and development is being carried out, but no new discoveries of importance have resulted up to date. The following announcement was made on the declaration of monthly results for May and June, and is here repeated for the information of shareholders: "The abnormally high profit is accounted for by the increase in the proportion of comparatively high grade ore from surface dumps put through the mill in order to take advantage of the high prices ruling for tin."

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ESTIMATES GIVEN.

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South African Mining Journal

General Mining and Finance Corporation, Limited.

(Incorporated in the Transvaal.)

NOTICE IS HEREBY GIVEN that the Seventeenth Ordinary General Meeting of Shareholders of the General Mining and Finance Corporation, Limited, will be held in the Board Room, General Mining Buildings, Johannesburg, on FRIDAY, the 17th DAY OF AUGUST, 1917, at 11 a.m., for the following purposes:—

1. To receive and consider the Balance Sheet and Profit and Loss Account, and the Directors and Auditors' Reports for the year ended 31st December, 1916.
2. To elect a Director in place of Mr. Jacob Freudenthal, who retires in terms of the Articles of Association, but who is eligible, and offers himself for re-election.
3. To appoint an Auditor or Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors.
4. To transact any other business which ought to be transacted at an Ordinary General Meeting.

The Share Transfer Books of the Corporation will be closed as follows:—

- (a) At the Head Office from the 13th of August to the 31st of August, 1917, both days inclusive.
- (b) In London from the 16th of July to the 21st of July, 1917, both days inclusive.

Holders of Share Warrants to Bearer desiring to be present or represented at the Meeting should deposit their Shares at the places and within the times following:—

Johannesburg:—At the Head Office of the Corporation, General Mining Buildings, at least three days before the time appointed for the holding of the meeting; or

London:—At the London Office (Transfer Department), Winchester House, Old Broad Street, E.C.;

Paris:—At the Paris Office, 29, Rue Taitbout; at the Bank de l'Union Parisienne, 7, Rue Chauchat;

At least thirty days before the date appointed for the holding of the meeting.

By Order of the Board,

H. W. DALTON,
Secretary.

General Mining Buildings,
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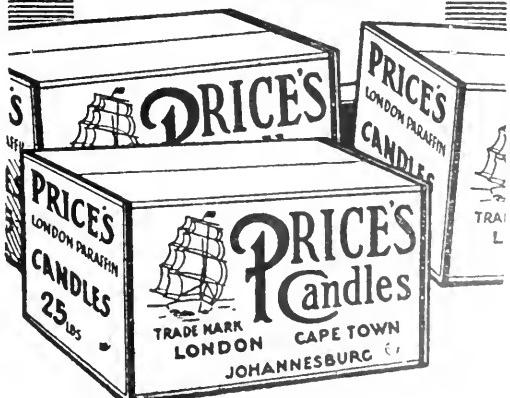
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